

Name: \_\_\_\_\_

Period: \_\_\_\_\_

### ALGEBRA 1 FINAL EXAM

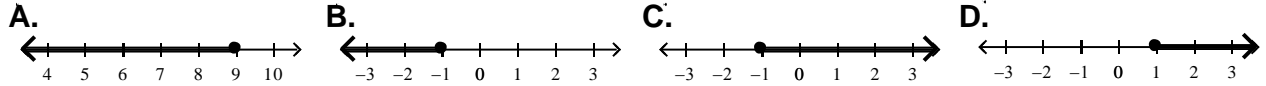
**DIRECTIONS:** Write the letter of the correct answer on the answer sheet provided.

1. Evaluate:  $4x^2 - x + 5$ , when  $x = -3$   
A. -34                      B. -28                      C. 38                      D. 44
2. Simplify:  $4^2 \cdot 2 + |1 + (5 - 3^2)|$   
A. 27                      B. 32                      C. 35                      D. 37
3. Solve:  $\frac{1}{2}(4x + 6) - (x - 1) = 3x - 8$   
A.  $x = 5$                       B.  $x = 6$                       C.  $x = 7.5$                       D.  $x = -3$
4. Solve  $-6m - 6 + 8m = -5 + 2m - 1$ . Describe the solution.  
A. Only 1 solution      B. Two solutions      C. No solution      D. All real #s
5. Solve:  $\frac{x + 12}{60} = \frac{9}{5}$   
A.  $x = 24$                       B.  $x = 96$                       C.  $x = 108$                       D.  $x = 124$
6. What is the y-intercept of  $2y = 8 - x$ ?  
A. (1, 2)                      B. (0, 4)                      C. (0, -4)                      D. (8, 0)
7. Which best describes the line passing through the points (-4, 3) and (2, 3)?  
A. Rises left to right      B. Falls left to right      C. Horizontal line      D. Vertical line
8. Which best describes the lines:  $3y = 15x + 4$   
 $y = 5x - 7$   
A. Intersecting      B. Parallel      C. Perpendicular      D. Same line
9. What is the slope of the line:  $x = 5$   
A. 5                      B. 1                      C. 0                      D. Undefined

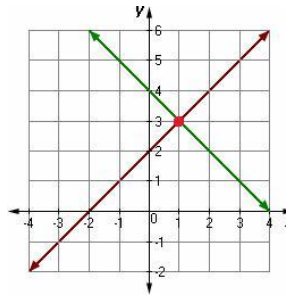
10. Write the equation in slope-intercept form of the line passing through (1, -7) and (-3, 5).

A.  $y = -\frac{1}{3}x + 4$       B.  $y = 3x + 14$       C.  $y = -3x - 4$       D. None of these.

11. Graph the solution of:  $2x - 5 \geq 3x - 4$



12. What is the solution to this system of equations?



A. (3, 1)      B. (1, 3)      C. (-2, 4)      D. No solution.

13. Simplify:  $(4x^2 - 3xy + y) - (2xy + y)$

A.  $4x^2 - xy + y$       B.  $4x^2 - xy$       C.  $4x^2 - 5xy$       D.  $4x^2 - 5xy + y$

14. Simplify:  $2x(3x^2 - 4x - 5)$

A.  $6x^3 - 8x^2 - 10x$       B.  $6x^3 + 8x^2 - 10x$       C.  $6x^3 - 8x^2 - 10$       D.  $6x^3 - 8x^2 + 10x$

15. Simplify:  $(2x + 3)(x - 4)$

A.  $2x^2 - 11x - 1$       B.  $2x^2 - 5x - 1$       C.  $2x^2 - 11x - 12$       D.  $2x^2 - 5x - 12$

16. Factor:  $3x^6 - 21x^5$

A.  $3x^4(x^2 - 7x)$       B.  $3(x^6 - 7x^5)$       C.  $3x^5(x - 7)$       D.  $x^5(3x - 21)$

17. Factor:  $4x^2 - 9$

A.  $(2x + 3)^2$       B.  $(2x + 3)(2x - 3)$       C.  $(2x - 3)^2$       D.  $(2x - 9)(2x + 1)$

18. Factor:  $x^2 + 2x - 8$
- A.  $(x+8)(x-2)$       B.  $(x+4)(x-2)$       C.  $(x-4)(x+2)$       D. Can't factor
19. Simplify:  $(x^7)^5$
- A.  $x^{12}$       B.  $x^2$       C.  $x^{35}$       D.  $x^{-2}$
20. Simplify:  $\frac{x^3}{x^{15}}$
- A.  $\frac{1}{x^{12}}$       B.  $\frac{1}{x^5}$       C.  $x^{12}$       D.  $x^5$
21. Simplify:  $(-3x^2y^4)^3$
- A.  $9x^5y^7$       B.  $-9x^5y^7$       C.  $27x^6y^{12}$       D.  $-27x^6y^{12}$
22. Simplify:  $\frac{5x^{-3}y^2}{15x^2y^{-4}}$
- A.  $\frac{y^6}{10x^5}$       B.  $\frac{y^8}{3x^6}$       C.  $\frac{y^2}{10x}$       D.  $\frac{y^6}{3x^5}$
23. Simplify:  $3a^2b^4 \cdot 4ab^{-4}$
- A.  $7a^3$       B.  $\frac{12a^2}{b^{16}}$       C.  $12a^3$       D.  $\frac{7a^3}{b^{16}}$
24. Simplify:  $\frac{-30x^5y^3}{-6x^3y^4}$
- A.  $\frac{-24x^2}{y}$       B.  $5x^2y$       C.  $\frac{5x^2}{y}$       D.  $-36x^2y$
25. Simplify:  $\sqrt{360}$
- A.  $6\sqrt{10}$       B.  $6\sqrt{7}$       C.  $5\sqrt{10}$       D.  $5\sqrt{7}$

26. A bag has 2 blue marbles and 6 red marbles. What is the probability of selecting a red marble, setting it aside, and then selecting another red marble?

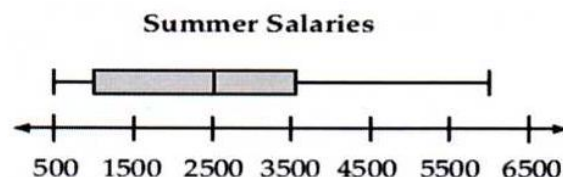
A.  $\frac{11}{15}$                       B.  $\frac{9}{16}$                       C.  $\frac{15}{28}$                       D.  $\frac{3}{4}$

27. The table at right shows how each student on an academic team has performed in competitions this year. The student with the greatest probability of answering a question correctly based on the table will be selected to answer a tie-breaking question. Which student will be selected?

A. Ben  
B. Carol  
C. Jude  
D. Kate

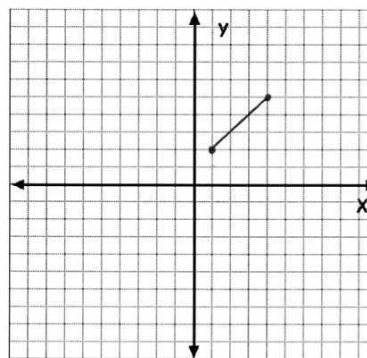
Academic Team Performance		
Student	Number of Questions Attempted	Number of Correct Responses
Ben	420	212
Carol	440	176
Jude	210	168
Kate	310	217

28. The box-and-whisker plot at right shows the summer salaries of teenagers working in a restaurant. Based on the box-and-whisker plot, which of the statements about the summer salaries must be true?



- A. The least number of salaries are between \$500 and \$1000.  
B. The average (mean) salary is \$2500.  
C. There are more teenagers who make over \$2500 than teenagers who make less than \$2500.  
D. About half the teenagers earn between \$500 and \$2500.

29. Identify the domain and range of the function.



- A.  $D: 2 \leq x \leq 5$   
 $R: 2 \leq y \leq 5$                       B.  $D: 1 \leq x \leq 4$   
 $R: 2 \leq y \leq 5$                       C.  $D: 2 \leq x \leq 5$   
 $R: 1 \leq y \leq 4$                       D.  $D: \text{All real numbers}$   
 $R: \text{All real numbers}$

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### ALGEBRA 1 FINAL EXAM

**PART 2:** Complete the following problems. Show your work. (4 pts. each).

**30.** You are planning a bike trip with your friends. Your goal is to reach a shore point, which is 105 miles away from your starting point. Each day you plan to ride 18 miles.

a. Complete the table below.

DAY	MILES COMPLETED
1	
2	
3	
4	
5	
6	
7	

b. Create a linear function that represents how far you travel after each day of riding.

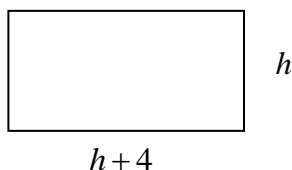
c. On which day would you reach your destination?

d. How many days would it take you to travel 200 miles?

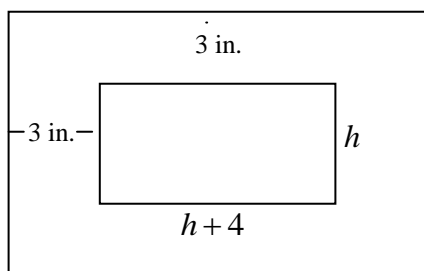
**31.** Factor completely:  $2x^3 - 12x^2 + 18x$

FINAL ANSWER: \_\_\_\_\_

32. James creates a painting on a rectangular canvas, with a width that is four inches longer than the height, as shown in the diagram below.



- a. Write a polynomial expression that represents the area of the canvas.
- b. James adds a 3 inch wide frame around all sides of the canvas. Write a polynomial expression, in simplified form, that represents the total area of the canvas and frame.



- c. Write a polynomial expression that represents the perimeter of the outside of the frame.

33. Solve:  $x = y - 4$   
 $3x + 2y = 13$

. There is no partial credit on this problem, so remember to check your solution.

SOLUTION: \_\_\_\_\_

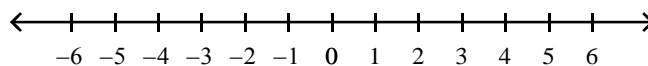
- 34.** A landscaping company placed two orders with a nursery. The first order was for 13 bushes and 4 trees; it totaled \$487. The second order was for 6 bushes and 2 trees; it totaled \$232. How much do the bushes and trees cost individually?

- 35.** Solve and graph on the number line:

$$-3 \leq 2x - 5 < 7$$

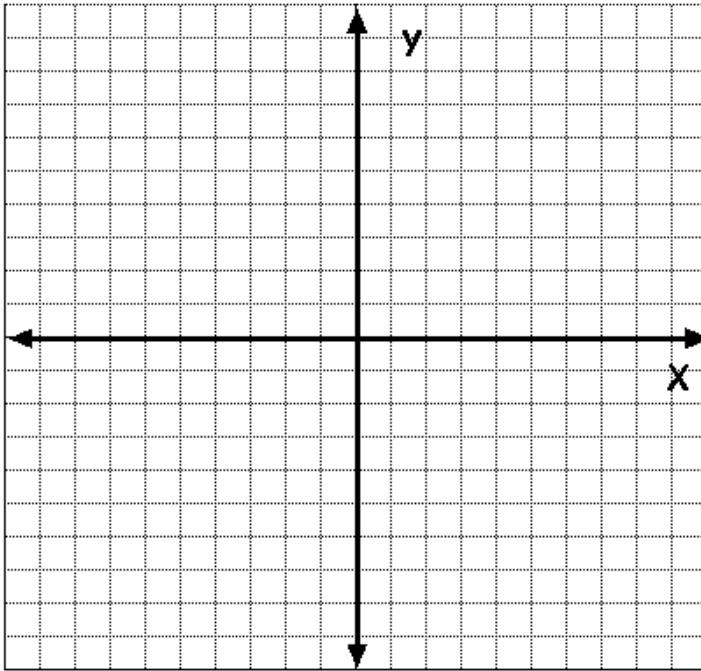
- a.** Solve the compound inequality.

- b.** Graph your solution on the number line provided below.



36.

- a. Graph the inequality:  $y > -2x - 1$  on the coordinate plane below. Show all your work and explain why you did each step.



- b. Explain how you could use your graph from Part A to determine if the ordered pair  $(2, -1)$  is a solution of the inequality.
- c. Determine, using algebra, if the ordered pair  $(-3, 6)$  is a solution of the inequality.